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Lawn Establishment in Kentucky

Gregg C. Munshaw, Plant and Soil Sciences

The methods you use, the grass you select and the time of year that you plant your lawn will often determine the quality and ease of maintenance. A quality lawn will increase the value and appeal of your property, and maintaining it can be satisfying work. When it comes to establishing a new lawn, the key is to do everything properly from the start so you will not have to try to fix the lawn once it is established.

Both cool-season and warm-season grasses can be grown in Kentucky. Kentucky is located in an area known as the transition zone, meaning half of the year weather is ideal for cool-season grasses while the other half of the year is suitable for warm-season grasses. Because of these temperature extremes in summer and winter, developing a really good lawn can be a challenge. Proper establishment and management techniques may differ considerably from those used in surrounding states. Still, if you know these local problems and establish your lawn correctly, a good lawn is possible and should not be expensive to maintain.

Which Grass Should You Plant?

Although Kentucky is considered the Bluegrass State, Kentucky bluegrass tends to struggle during the heat of our summers and requires more work and money to keep it looking good. Tall fescue, however, is the best adapted grass for Kentucky as it has good heat and cold tolerance. Tall fescue provides the best looking lawn with the fewest amounts of inputs. Lawns with shade, poor soil, or heavy traffic and lawns in the western part of Kentucky should almost always choose tall fescue. When purchasing tall fescue seed, it is paramount to select a turf-type tall fescue rather than Kentucky 31. Selecting a turf-type tall fescue will result in a lawn that will be finer leafed, thicker, darker green, and have much lower mowing requirements. Fine fescue and perennial ryegrass also have some limited uses in lawns. Perennial ryegrass germinates quickly and is good for keep-



Figure 1. Topsoil stockpiled on the edge of the lot awaiting construction completion. This pile is likely not large enough to provide 4-6 inches of topsoil over the entire yard.

ing soil in place on slopes. Fine fescue has excellent shade tolerance so can be used where other grasses cannot.

Lawns can also be established with warm-season grasses such as bermudagrass or zoysiagrass. Although these grasses remain dormant (brown) for six to seven months every year, they have good drought and pest tolerances.

You can learn more about the strengths and weaknesses of each grass from the UK Extension publication AGR-216, "Turfgrasses of Kentucky." More information on varieties is available at www.uky.edu/ag/ukturf/lawns.html.

When to Establish Your Lawn

Don't make the mistake of establishing your lawn at the wrong time. Only certain periods each year have favorable temperature, moisture, and minimum competition from weeds as well as give your grass the time to establish before unfavorable temperatures occur.

Establishment of Cool-Season Grasses

The best time to seed cool-season grasses such as Kentucky bluegrass or tall fescue is from mid-August to late September. Early fall is best due to cool-

ing temperatures, fall rains, no competition from crabgrass or goosegrass, and 7 to 8 months of root development and maturation before the summer stress period. The second best time is from mid-February to mid-March but not later than mid-April. Look for the shrub forsythia to bloom as a good indicator of when to plant seed. Spring seedings will likely require a specific pre-emergent herbicide applied at planting to reduce competition from crabgrass. Siduron and mesotrione are herbicides that have activity on crabgrass but will allow your cool-season grass to germinate. Post-emergent herbicides such as quinclorac can be used later in the establishment phase for crabgrass control. Be sure to follow the label directions and calibrate before using a pesticide. Due to competition from weeds and moisture and heat stress, seedings sown from late spring to midsummer are often unsuccessful.

Kentucky bluegrass and tall-fescue sod can be installed almost anytime. However, during extremely hot and dry summers, it is best to delay sodding until the weather is more suitable. During cold winters, sod installation should not occur when soil is frozen.

Establishment of Warm-Season Grasses

Warm-season grasses such as bermudagrass and zoysiagrass should be established during late-May or June, after the soil is warm. Nighttime air temperatures should be consistently greater than 60°F when planting warm-season grasses. Warmer temperatures when planting warm-season grasses will result in faster and easier establishment.

Preparing the Soil

Never underestimate the importance of soil preparation. Consider the following:

Grading

Soil conditions are very poor on many lawn sites because the lawn was not a major consideration when home construction began. Ideally, the topsoil should be stockpiled to the corner of the lot when initial grading is done so it will not be destroyed or covered by the foundation or basement subsoil (Figure 1).

After the house is finished, the building debris should be removed from the entire lawn area, and the subgrade should be sloped away from the house to reduce the possibility of water entering the basement (Figure 2). After the subgrade has been established, the stockpiled topsoil can be spread over the entire lawn. With 4-6 inches of good topsoil, establishing and maintaining your lawn can be a pleasure rather than a nightmare. Oftentimes, however, construction debris is buried by 1-2 inches of topsoil. If you are involved in the construction of a new house, insist that the site is cleaned and all the topsoil is returned to the lot.

Soil Improvements

If construction debris was not removed after building, do your best to remove concrete, wood, and other debris as you uncover it. This debris limits the ability of roots to grow down to get water. This can result in dry spots in the lawn where debris is buried. If the topsoil on your lot is shallow, it is usually not the best idea to purchase topsoil as it is difficult to purchase good topsoil. Frequently, you get heavy clay or rocky soil that can be infested with weed seed or stems from weedy grasses such as quackgrass or bermudagrass. Well-adapted species such as tall fescue may be grown on the most dif-



Figure 2. Building debris remaining around foundation of house following construction. If buried, this debris will cause difficulties in growing a lawn or landscape plants.

ficult soils as long as their nutrient levels and pH are addressed on the basis of a soil test. In fact, an excellent tall fescue turf can be maintained on heavy clay or sandy soils if the lawn can be irrigated during periods of summer drought.

To improve soils with very little topsoil, the best option is to amend the soil with composted organic matter. Organic material will improve soils that contain too much clay by improving drainage and too much sand by improving nutrient retention. Peat moss; well-decomposed sawdust; well-rotted, weed-free manure;

sewage sludge; or most organic compost can be used to improve poor soils. Use 2-3 cubic yards of organic matter for each 1,000 square feet of lawn area. Spread it evenly over the surface, and before seeding, thoroughly rototill or disk it into the upper 4-6 inches of soil.

Lime and Fertilizer

Lawns need fertilizer to grow and be healthy. Without a soil test, however, you are applying fertilizer blindly. Having your soil tested will determine its exact lime and fertilizer needs. By applying



Figure 3. Soil prior to planting seed, sod, sprigs, or plugs should be firm and free of any debris.

fertilizer without taking a soil test, you may be wasting money and, more importantly, polluting the environment. Your local county Extension office can provide you with soil bags and specific instructions on how to take a soil test. The soil-test report will tell you specifically how much of each nutrient your soil requires. Prior to establishment is the ideal time to amend the soil with large quantities of nutrients or lime without concern of burning the lawn. Work all lime and fertilizer into the top 4-6 inches of soil before seeding. For more information on liming and fertility, see the UK Extension Publications AGR-212, "Fertilizing Your Lawn" and AGR-214, "Liming Kentucky Lawns."

Final Soil Preparation

A newly graded lawn should be allowed to settle before planting. Two or three good rains (0.25" or more) or irrigations will help the settling. Puddles of water that form during a rain or irrigation indicate low spots that should be filled or drained prior to planting. Good surface drainage is a must and be sure that water is channeled away from the foundation, sidewalks/driveways, etc. If you are planning on adding an irrigation system, it is best to install it at this point, prior to seed being planted. The final seedbed should be firm and free of large clods, rocks, and discarded building materials (Figure 3). The good news is that seedbed preparation is similar regardless of which planting method is used on a new lawn.

Seed or Sod?

Kentucky bluegrass, tall fescue, zoysiagrass, and bermudagrass lawns can be seeded or sodded.

Should you seed or sod? Initially, seeding a lawn is less expensive, but getting an established lawn may take a few months compared to sod. Also, the risk of soil erosion is minimized with sod.

In addition, when you use quality seed or quality sod, you have little chance of introducing troublesome weeds. Even though many weed seeds are already present in your soil, quality sod will impede growth of these weeds, while quality seed will not add additional weeds.

Finally, a sodded lawn is immediately attractive and somewhat serviceable.

Mud is not tracked into the home, sidewalks can be kept clean, and it is easy to maintain other newly planted landscape plants.

Certified Seed

When purchasing any grass seed it is important to purchase certified seed. Certified seed will come with a blue tag and guarantees that what the tag states is in the bag is actually in the bag (Figure 4). Certified seed is typically low in weed seed and usually indicates better varieties. However, always check UK's variety recommendations (www.uky.edu/ag/ukturf/lawns.html) or contact your county agent to be sure you are purchasing quality seed.

Pure Live Seed

When determining how much seed to purchase for a lawn, it is important to factor how pure the seed is and how well it germinates. Fortunately this can be done using a pure live seed (PLS) calculation. Pure live seed accounts for everything in the bag that is not the desired seed in addition to how well the seed germinates. The PLS calculation is simple but will require that you identify the percent germination and the percent purity located on the seed tag (Figure 5). Plug the numbers off the seed tag into the following equation:

$$PLS = \% \text{ purity} \times \% \text{ germination} \div 100$$

From the seed tag in Figure 5, we can determine PLS for this bag of seed.

$$\begin{aligned} PLS &= 49\% \times 85\% \\ &= 4,165\% \div 100 \\ &= 41.65\% \end{aligned}$$

Because the seed in Figure 5 is coated, the purity is lower. If we were to plant this seed at the recommended rate for bermudagrass (1 lb./1,000 sq. ft.) we would actually be only planting less than ½ lb./1,000 sq. ft. because only 41.65% is bermudagrass seed that is going to germinate. To make sure you plant enough seed, we need to do a second simple calculation. To account for the difference, divide the seed rate (in this case 1 lb./1,000 sq. ft.) by 0.4165 (0.4165 is the decimal form of 41.65%) to account for PLS.

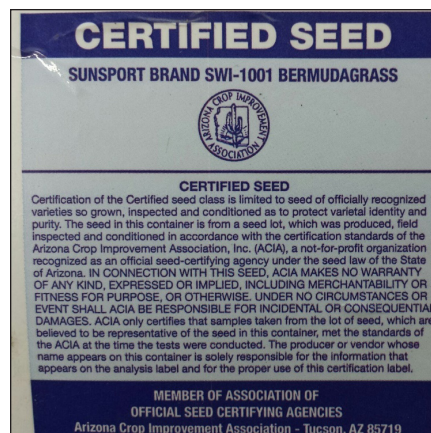


Figure 4. A blue certified seed tag indicates quality seed.

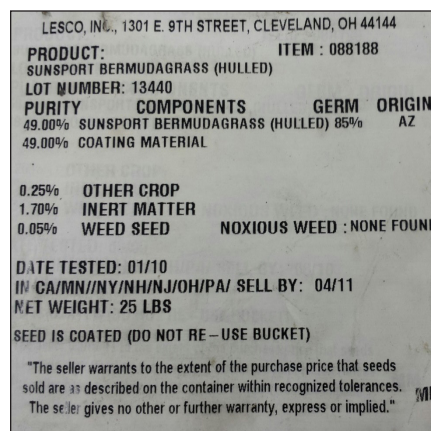


Figure 5. Important information on a typical seed tag includes purity, germination, weed seed, and date tested. Look for high germination and purity percentages, a low amount of weed seed, and seed that has been recently tested.

Total amount of seed per 1,000 sq. ft. needed to be purchased to account for PLS =

$$\text{Seed rate} \div PLS = \text{Seed needed per 1,000 sq. ft.}$$

$$1 \text{ lb./1,000 sq. ft.} \div 0.4165 = 2.4 \text{ lbs. of actual seed/1,000 sq. ft.}$$

Now that we know how much of what is in the bag will grow, we can figure out how many pounds of seed we will need for a lawn. If you are not sure of the size of your lawn, you can determine the area using several methods.

Tape measure. Using a tape measure, you can determine the length and width of the area you are planning on seeding. Area = length x width, and your area will likely be in square feet.

GPS. Some handheld GPS devices are excellent for walking the area you are planning on seeding and will determine the area for you. Apps are available for smartphones that will assist you in measuring the area of your lawn.

Google Earth. This program allows you to draw lines and make basic measurements of properties.

How to Seed

1. Seeding is usually done with a rotary spreader. These spreaders will throw seed for several feet on either side of the spreader and will do a great job of evenly spreading out the seed. Drop type spreaders are not ideal for planting as it is much more difficult to evenly distribute the seed over the lawn. Kentucky bluegrass should be seeded at 2 lb. PLS/1,000 sq. ft. and tall fescue should be seeded at 6 lb. PLS/1,000 sq. ft. The reason more tall-fescue seed is needed is because the seeds are so much larger than Kentucky bluegrass. Handheld rotary spreaders are great for seeding small areas and for small seeded grasses such as bluegrass, zoysiagrass, or bermudagrass.
2. For uniform distribution, divide the seed in half. Seed the lawn with the first half of the seed in one direction, and then apply the second half of the seed crosswise over the first run to minimize the chance of any skipped areas. Failure to do this often results in lines or stripes during seed emergence.
3. Cover the seed by raking lightly or rolling with a water-ballast roller to improve seed-to-soil contact. Seed-to-soil contact is critical for proper germination and growth to occur. If seeds lay on top of the soil they will not have access to water to begin the germination process.
4. Mulch the area with clean straw or other suitable material. The mulch covering should be thin enough to expose about 50 percent of the soil surface, which means using about one bale of straw per 1,000 sq. ft. of area (Figure 6).
5. Water frequently, especially if you do not use mulch. Keep the soil surface moist until the seedlings become established but be sure not to water long enough for puddles to form as

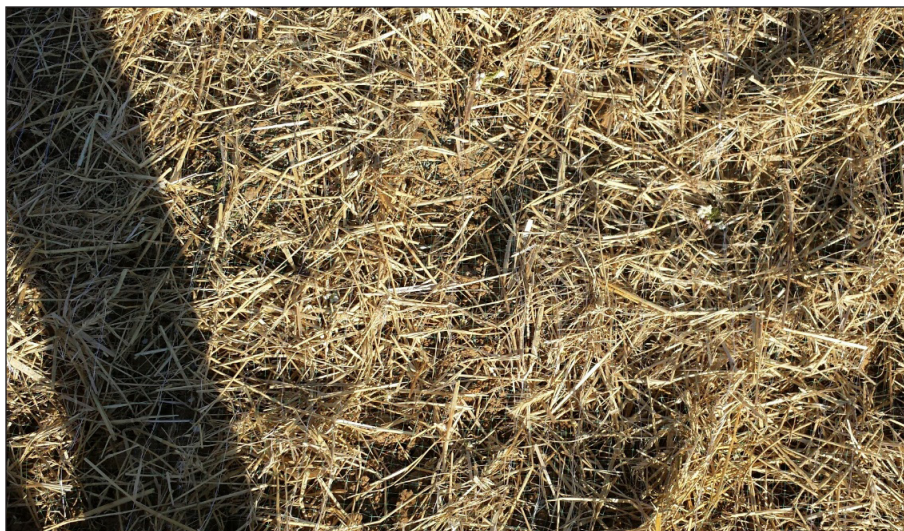


Figure 6. Adding mulch after seeding helps keep seed and soil in place when irrigating or raining.

this will cause seed to move and will reduce germination and uniformity.

How to Install Sod

Installing sod is an art. The better the sod quality, the easier it is to transport and install. Quality sod is light, does not tear apart easily, and generates a root system quickly. Remember: Sod is a mature plant just lacking roots due to the harvesting procedure. Before ordering or obtaining sod, be sure you are prepared to install it. Sod is perishable and should not remain on the pallet or stack longer than 36 hours. Be sure to have the soil prepared just as you would for seeding prior to sod delivery.

To install sod:

1. Inspect the sod carefully. If you see mildew or distinct yellowing of the leaves, its quality is already diminished. Sod should be cut at the sod farm the day it is delivered to you.
2. Begin laying sod on one side of the yard and work your way across the yard.
3. Make sure that each row of sod is staggered, similar to laying bricks (Figure 7).
4. Use a sharpened concrete trowel or shovel to cut pieces and to tightly force the sod into place. You can also use the trowel or shovel to level small depressions.



Figure 7. Staggering sod rows minimizes seams and slows water movement down slopes. Laying sod results in a uniform weed free lawn and can be established at almost any time of year.

5. Immediately after the sod is laid, roll the lawn to increase sod to soil contact. If any air pockets between the sod and soil exist, the very short grass roots on the sod will not have access to water in the soil and will dry out and die.

Sprigging or Plugging

Improved strains of bermudagrass and zoysiagrass are usually planted from existing vegetative material—either sod, sprigs, or plugs. Vegetative planting using sprigs is the common method for establishing high quality bermudagrass. Zoysiagrass is most frequently plugged. The plugs are approximately 2 inches in diameter, with 2 inches of soil.

Sprigs are live plant stems, usually 1 to 4 inches long. One bushel of sprigs is approximately equal to 1 square yard of sod. You can buy sprigs by the bushel or buy sod and then shred the sod into sprigs with a soil shredder or tear the sod apart by hand.

Planting Sprigs

1. Either broadcast sprigs over the lawn and cover them lightly with soil or plant (press) them individually into the soil on 6- to 12-inch centers. Properly planted, an individual sprig should have one end about 2 inches below the soil surface and the other end above the soil surface so that a node or joint with some leaves extends above ground.
2. Keep the soil persistently wet until they are well established. Stem desiccation is often the primary reason for establishment failure with sprigs. It is imperative to keep the area watered during the initial establishment.

Planting Plugs

1. Make holes in soil prepared just as you would for seeding on 1 foot centers (i.e. 1 foot between plugs and 1 foot between each row).
2. Fit plugs tightly into prepared holes. These holes can be made with a zoysia plugger—a sharp tube that can extract a soil core that is the same size as the zoysia plug. In order to force the tube into the soil, good soil moisture is required.
3. Tamp plugs firmly into place by stepping on each one.
4. Keep plugs moist until they are well established.

5. The closer plugs are planted, the faster the area will establish.

Caring for New Lawns

Irrigation

Irrigation is critical after planting as seeds must absorb water to germinate. Once germination occurs, young seedlings with short roots require constant moisture to survive. Irrigate seeded sites lightly and frequently until germination is complete.

The best way to irrigate sod and plugs is to water the grass and surface soil to the saturation point. Then, keep the sod moist until it is well-rooted in the underlying soil.

Sprigs must be kept continuously moist for usually the first 10-14 days. If they dry out at all, they may not survive. Pay close attention to sprigs after planting.

The amount of water required is dependent on the kind of soil you have, if there are any slopes, and on the environment. Clayey soils will need less water than sandy soils as water tends to drain well through sandy soils. Sloped areas tend to dry out more quickly than flat areas so they will need additional water. Finally, the environment will dictate how much you will need to irrigate. Sunny and warm days will cause more evaporation of water from the soil and more irrigation will be needed than cloudy days. Also, rainfall needs to be monitored during germination. Be sure to keep soils moist but avoid puddling. Regardless of which establishment method you use, keep the soil moist for two to three weeks. For more information on irrigating lawns, see the UK Cooperative Extension Publication AGR-115, "Irrigation Tips to Conserve Water and Grow a Healthy Lawn."

Mowing

Don't be afraid to mow a new lawn. New lawns do not need to reach 4 or 5 inches in height before being mowed. Instead, wait until the turf is approximately a third higher than the intended height and then mow. For instance, if the intended height is 2 inches, mow when the grass reaches 3 inches. By mowing early and not letting excessive grass accumulate, the texture will be finer, many upright weeds will be killed, and the turf will be-

come more dense. For more information on mowing and recommended mowing heights for various species, see the UK Cooperative Extension Publication AGR-209, "Mowing your Kentucky Lawn."

Fertilization

Ideally, fertilizer and lime requirements indicated by the soil test were incorporated into the soil prior to planting. No additional fertilizer needs to be applied until after seeds have germinated and a root system has begun to grow to take up the fertilizer. When seedlings get about 1 inch in height you can begin fertilizing based on the soil test recommendations. Be careful to water fertilizer in so it does not burn seedlings. For sod, plugs, or sprigs, it is also best to wait to fertilize until roots begin to grow. Usually by two to three weeks after planting, roots are growing into the soil and will be able to take in fertilizer.

Weed Control

Until the lawn begins to thicken up after the seed starts to germinate, competition for weeds is basically non-existent and you may see many show up in the lawns. For weed control, it is generally a good practice to avoid applying any herbicides until after the grass has been mowed three times. This practice will help ensure the grass is mature enough to handle pesticide applications. When sodding, the new sod should be weed free and as long as it is properly cared for after laying, should remain weed free. For more information on weed control products, see the UK Cooperative Extension Publications AGR-208, "Weed Control for Kentucky's Home Lawns" and AGR-218, "Herbicide Recommendations for Weed Control in Kentucky Bluegrass and Tall Fescue Lawns for Professional Applicators."

Conclusion

Although there are several steps to properly establishing a lawn, the more time you spend ensuring that the soil is good, getting the soil prepared, and caring for the new lawn, the less likely you will spend excessive amounts of time fixing the lawn in the future. By following these guidelines, you can have a thick healthy lawn that will require fewer chemical inputs, saving you money and helping to protect the environment.

